HID CORPORATION TEST REPORT

FOR THE

6074A HID MIFARE WIEGAND READER

FCC PART 15 SUBPART C SECTIONS 15.207, 15.209 & 15.225

COMPLIANCE

DATE OF ISSUE: JUNE 30, 2004

PREPARED FOR:

HID Corporation
9292 Jeronimo Road
Irvine, CA 92618

P.O. No.: 10001838
W.O. No.: 81687

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: April 27 - May 6, 2004

Report No.: FC04-050

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	April 27 - May 6, 2004
DATE OF RECEIPT:	May 5, 2004
PURPOSE OF TEST:	To demonstrate the compliance of the 6074A HID Mifare Wiegand Reader with the requirements for FCC Part 15 Subpart C Sections 15.207, 15.209 & 15.225 devices.
TEST METHOD:	ANSI C63.4 (2001)
MANUFACTURER:	HID Corporation 9292 Jeronimo Road Irvine, CA 92618
REPRESENTATIVE:	Frank de Vall
TEST LOCATION:	CKC Laboratories, Inc. 5473A Clouds Rest Mariposa, CA 95338

SUMMARY OF RESULTS

As received, the HID 6074A HID Mifare Wiegand Reader was found to be fully compliant with the following standards and specifications:

Canadian Standard	Canadian Section	FCC Standard	FCC Section	Test Description
RSS 210	6.2.1	47CFR	15.209	General Radiated Emissions Requirement
RSS 210	6.2.2(e)	47CFR	15.225(a)	Fundamental Requirements
RSS 210	6.2.2(e)	NA	NA	±150kHz to ±450kHz Emissions Requirement
RSS 210	6.6	47CFR	15.207	AC Mains Conducted Emissions Requirement
	IC 3171-D		91100	Site No.

CONDITIONS FOR COMPLIANCE

Note 1) Power supply ground terminal connected to ground plane with a short wire. Note 2) Power supply negative tied to ground terminal.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

Art Rice, EMC Test Engineer

FCC 15.33(a) Frequency Ranges Tested
15.207 Conducted: 150 kHz – 30 MHz
15.209 Radiated: 9 kHz – 1000 MHz

FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz

Eut Operating Frequency
The EUT was operating at 13.56 MHz.

Temperature And Humidity During Testing
The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION
The EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

HID Mifare Wiegand Reader
Manuf: HID
Model: 6074A
Serial: CKC050504
FCC ID: JQ6607XA

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):
DC Power Supply
Manuf: Tektronix
Model: CPS250
Serial: CPS-250TW18988
FCC ID: NA

REPORT OF MEASUREMENTS

The following tables report the worst case emissions levels recorded during the tests performed on the EUT. All readings taken were peak readings unless otherwise stated. The data sheets from which the emissions tables were compiled are contained in Appendix C.

Table 1: FCC 15.225(a) Fundamental

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
13.563	31.0	8.9		1.1	-19.0	22.0	84.0	-62.0	V
13.563	30.1	8.9		1.1	-19.0	21.1	84.0	-62.9	H

Test Method: ANSI C63.4 (2001)
Spec Limit: FCC Part 15 Subpart C Section 15.225(a)
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a Smart Card Reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. Power supply is placed on the ground plane. Excess length of the cable is bundled in the center. EUT drain wire connected to ground terminal on power supply. EUT foil shield connected to DC negative terminal on power supply. Note 1) Power supply ground terminal connected to ground plane with a short wire. Measuring the transmit fundamental. Frequency Range Investigated: 0.009 to 30 MHz. Test distance correction factor used in accordance with 15.31 of 40dB per decade for comparison to the limit.

Table 2: FCC 15.207 Six Highest Conducted Emission Levels									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Lisn dB	dB	Cable dB	dB	READING dBµV	LIMIT dBµV	MARGIN dB	NOTES
0.151000	58.3	1.8		0.2		60.3	65.9	-5.6	WQ
0.380000	53.5	0.6		0.2		54.3	58.3	-4.0	BQ
0.380000	52.6	0.6		0.2		53.4	58.3	-4.9	WQ
0.915277	38.6	0.5		0.2		39.3	46.0	-6.7	W
13.580440	39.1	0.5		0.8		40.4	50.0	-9.6	B
13.580440	37.7	0.5		0.8		39.0	50.0	-11.0	W

Test Method: ANSI C63.4 (2001)
Spec Limit: FCC Part 15 Subpart C Section 15.207

NOTES: Q = Quasi Peak Reading
B = Black Lead
W = White Lead

COMMENTS: EUT is a Smart Card Reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. Power supply is placed on the ground plane. Excess length of the cable is bundled in the center. EUT drain wire connected to power supply ground terminal. EUT foil shield connected to DC negative on power supply. Note 1) Power supply ground terminal connected to ground plane with a short wire. Note 2) Power supply negative tied to ground terminal. Frequency Range Investigated: 0.15 to 30 MHz.

Table 3: FCC 15.209 Highest Radiated Emission Levels: 9 kHz to 30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
27.124	17.1	-12.6		1.7		6.2	29.5	-23.3	V
27.124	16.7	-12.6		1.7		5.8	29.5	-23.7	H

Test Method: ANSI C63.4 (2001)
Spec Limit: FCC Part 15 Subpart C Sections 15.209/15.225
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a Smart Card Reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. Power supply is placed on the ground plane. Excess length of the cable is bundled in the center. EUT drain wire connected to ground terminal on power supply. EUT foil shield connected to DC negative terminal on power supply. Note 1) Power supply ground terminal connected to ground plane with a short wire. Measuring the spurious signals. Frequency Range Investigated: 0.009 to 30 MHz. Test distance correction factor used in accordance with 15.31 of 40 dB per decade for comparison to the limit.

Table 4: FCC 15.209 Six Highest Radiated Emission Levels: 30 to 1000 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
393.335	34.4	14.5	-27.2	7.4	10.0	39.1	46.0	-6.9	V
406.868	32.8	14.8	-27.3	7.6	10.0	37.9	46.0	-8.1	V
420.430	34.3	15.1	-27.5	7.7	10.0	39.6	46.0	-6.4	V
434.009	32.9	15.4	-27.6	7.7	10.0	38.4	46.0	-7.6	V
447.539	31.9	15.7	-27.7	8.1	10.0	38.0	46.0	-8.0	V
447.559	34.8	15.7	-27.7	8.1	10.0	40.9	46.0	-5.1	H

Test Method: ANSI C63.4 (2001)
Spec Limit: FCC Part 15 Subpart C Sections 15.209
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a Smart Card Reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. Power supply is placed on the ground plane. Excess length of the cable is bundled in the center. EUT drain wire connected to power supply ground terminal. EUT foil shield connected to DC negative on power supply. Frequency Range Investigated: 30 to 1000 MHz. Test distance correction factor of 20 dB per decade used in accordance with FCC 15.31 to extrapolate test data for comparison to the limit.

FREQUENCY STABILITY AND VOLTAGE VARIATIONS

Test Conditions: EUT is a Smart Card reader operating on a frequency of 13.56 MHz. The EUT is located inside of a temperature chamber and is powered via external DC power supply.

Customer: HID
WO#: 81687
Test Engineer:

Device Model #: 6074A
Operating Voltage: 12 **VDC**
Frequency Limit: 0.01 **%**

Temperature Variations

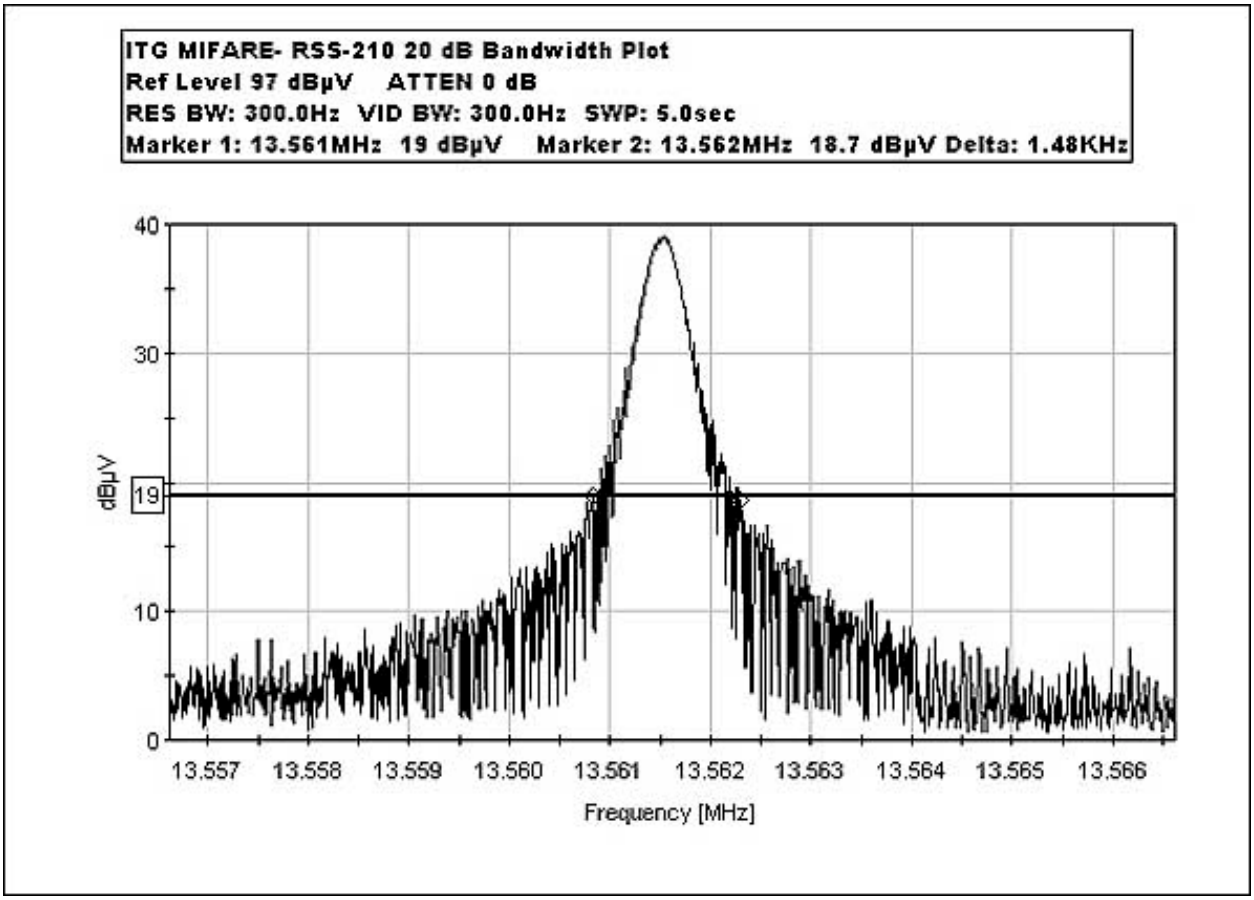
		Channel 1 (MHz)	**Dev. (MHz)**
Channel Frequency:		**13.561475**	
Temp (C)	Voltage		
-30	12	13.56126	0.00021
-20	12	13.56134	0.00014
-10	12	13.56140	0.00007
0	12	13.56144	0.00004
10	12	13.56145	0.00002
20	12	13.56148	0.00000
30	12	13.56145	0.00002
40	12	13.56145	0.00002
50	12	13.56146	0.00001

Voltage Variations (±15%)

20	10.2	13.56148	0.00000
20	12	13.56148	0.00000
20	13.8	13.56146	0.00001

Max Deviation (MHz)	**0.00021**
Max Deviation (%)	**0.00157**
	PASS

RSS-210 20dB BANDWIDTH PLOT



EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The radiated and conducted emissions data of the EUT was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: SAMPLE CALCULATIONS

	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Appendix B were used to collect both the radiated and conducted emissions data. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For frequencies from 30 to 1000 MHz, the biconilog antenna was used. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dBµV, and a vertical scale of 10 dB per division.

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the Tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

EUT TESTING

Mains Conducted Emissions

During conducted emissions testing, the EUT was located on a wooden table measuring approximately 80 cm high, 1 meter deep, and 1.5 meters in length. One wall of the room where the EUT was located has a minimum 2 meter by 2 meter conductive plane. The EUT was mounted on the wooden table 40 cm away from the conductive plane, and 80 cm from any other conductive surface.

The vertical metal plane used for conducted emissions was grounded to the earth. Power to the EUT was provided through a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 80 cm away from the EUT during the conducted test.

The LISNs used were 50 µH-/+50 ohms. Above 150 kHz, a 0.15 µF series capacitor was added in-line prior to connecting the analyzer to restore the proper impedance for the range. A 30 to 50 second sweep time was used for automated measurements in the frequency bands of 150 kHz to 500 kHz, and 500 kHz to 30 MHz. All readings within 20 dB of the limit were recorded, and those within 6 dB of the limit were examined with additional measurements using a slower sweep time.

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable and raising and lowering the antenna from one to four meters as needed. The test engineer maximized the readings with respect to the table rotation, antenna height, and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

APPENDIX A

TEST SETUP PHOTOGRAPHS

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

Mains Conducted Emissions - Front View

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

Mains Conducted Emissions - Side View

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Side View

PHOTOGRAPH SHOWING TEMPERATURE TESTING

APPENDIX B

TEST EQUIPMENT LIST

15.225(a)

Function	S/N	Calibration Date	Cal Due Date	Asset #
S.A. RF Section HP 8568A	2049A01408	07/03/2003	07/03/2005	00313
S.A. Display HP 85662A	2112A02174	07/03/2003	07/03/2005	02509
QP Adapter HP 85650A	2521A00904	07/03/2003	07/03/2005	02495
Cable. Rad., Site D 3M or 10M	rad_cab_10M_01_hd	07/03/2003	07/03/2005	None
Ant., Mag loop Emco 6502	2078	08/23/2002	08/23/2004	00432

15.207

Function	S/N	Calibration Date	Cal Due Date	Asset #
S.A. RF Section HP 8568A	2049A01408	07/03/2003	07/03/2005	00313
S.A. Display HP 85662A	2112A02174	07/03/2003	07/03/2005	02509
QP Adapter HP 85650A	2521A00904	07/03/2003	07/03/2005	02495
Cable, Cond HD	cond_cbl_hd_02	11/11/2002	11/11/2004	None
Cable, Cond HD	cond_cbl_hd_02	11/11/2002	11/11/2004	None
Solar LISN, 927109	9252-50-R-24-BNC	09/23/2003	09/23/2004	00612

15.209 9 kHz to 30 MHz

Function	S/N	Calibration Date	Cal Due Date	Asset #
S.A. RF Section HP 8568A	2049A01408	07/03/2003	07/03/2005	00313
S.A. Display HP 85662A	2112A02174	07/03/2003	07/03/2005	02509
QP Adapter HP 85650A	2521A00904	07/03/2003	07/03/2005	02495
Cable. Rad., Site D 3M or 10M	rad_cab_10M_01_hd	07/03/2003	07/03/2005	None
Ant., Mag loop Emco 6502	2078	08/23/2002	08/23/2004	00432

15.209 30-1000 MHz

Function	S/N	Calibration Date	Cal Due Date	Asset #
S.A. RF Section HP 8568A	2049A01408	07/03/2003	07/03/2005	00313
S.A. Display HP 85662A	2112A02174	07/03/2003	07/03/2005	02509
QP Adapter HP 85650A	2521A00904	07/03/2003	07/03/2005	02495
Ant., Bilog, Chase CBL6111C	2451	10/04/2002	10/04/2004	1995
Cable. Rad., Site D 3M or 10M	rad_cab_10M_01_hd	07/03/2003	07/03/2005	None
Preamp, HP-8447D	2727A05432	08/05/2003	08/05/2005	00282

Frequency Stability

Function	S/N	Calibration Date	Cal Due Date	Asset #
Digital Multimeter Radio Shack 22-183	NA	NR	NR	01241
Spectrum Analyzer 100Hz - 22.5GHz HP 8566B	2209A01404	02/26/2003	02/26/2005	00490
Spectrum Analyzer Display HP 8566B	2403A08241	02/26/2003	02/26/2005	00489
Spectrum Analyzer QP Adapter HP 85650A	2811A01267	02/26/2003	02/26/2005	00478
Temp Chamber Thermotron S-1.2 MiniMax	11899	1/31/2003	1/31/2005	01879

NR = Not Required

APPENDIX C:

MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories •480 Los Viboras Rd. Site D • Hollister, CA 95023 • 1-831-637-8176

Customer: **HID**
Specification: **FCC 15.225(a) (30 Meters)**
Work Order #: **81687** Date: 05/05/2004
Test Type: **Radiated Scan** Time: 15:46:47
Equipment: **Smart Card Reader** Sequence#: 8
Manufacturer: HID Tested By: Art Rice
Model: ITG MIFARE
S/N: CKC050504

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Smart Card Reader*	HID	ITG MIFARE	CKC050504

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Tektronix	CPS250	CPS-250TW18988

Test Conditions / Notes:

EUT is a Smart Card Reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. Power supply is placed on the ground plane. Excess length of the cable is bundled in the center. EUT drain wire connected to ground terminal on power supply. EUT foil shield connected to DC negative terminal on power supply. Note 1) Power supply ground terminal connected to ground plane with a short wire. Measuring the transmit fundamental. Frequency Range Investigated: 0.009 to 30 MHz. Test distance correction factor used in accordance with 15.31 of 40dB per decade for comparison to the limit.

Transducer Legend:

T1=10m or 3m radiated cable Site D	T2=Mag Loop A/N 00432, S/N 2078

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.563M	31.0	+1.1	+8.9			-19.0	22.0	84.0	-62.0	Vert
2	13.563M	30.1	+1.1	+8.9			-19.0	21.1	84.0	-62.9	Horiz

Test Location: CKC Laboratories •480 Los Viboras Rd. Site D • Hollister, CA 95023 • 1-831-637-8176

Customer: **HID**
Specification: **FCC 15.207 COND [AVE]**
Work Order #: **81687** Date: 05/05/2004
Test Type: **Conducted Emissions** Time: 12:07:29
Equipment: **Smart Card Reader** Sequence#: 3
Manufacturer: HID Tested By: Art Rice
Model: ITG MIFARE 120V 60Hz
S/N: CKC050504

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Smart Card Reader*	HID	ITG MIFARE	CKC050504

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Tektronix	CPS250	CPS-250TW18988

Test Conditions / Notes:

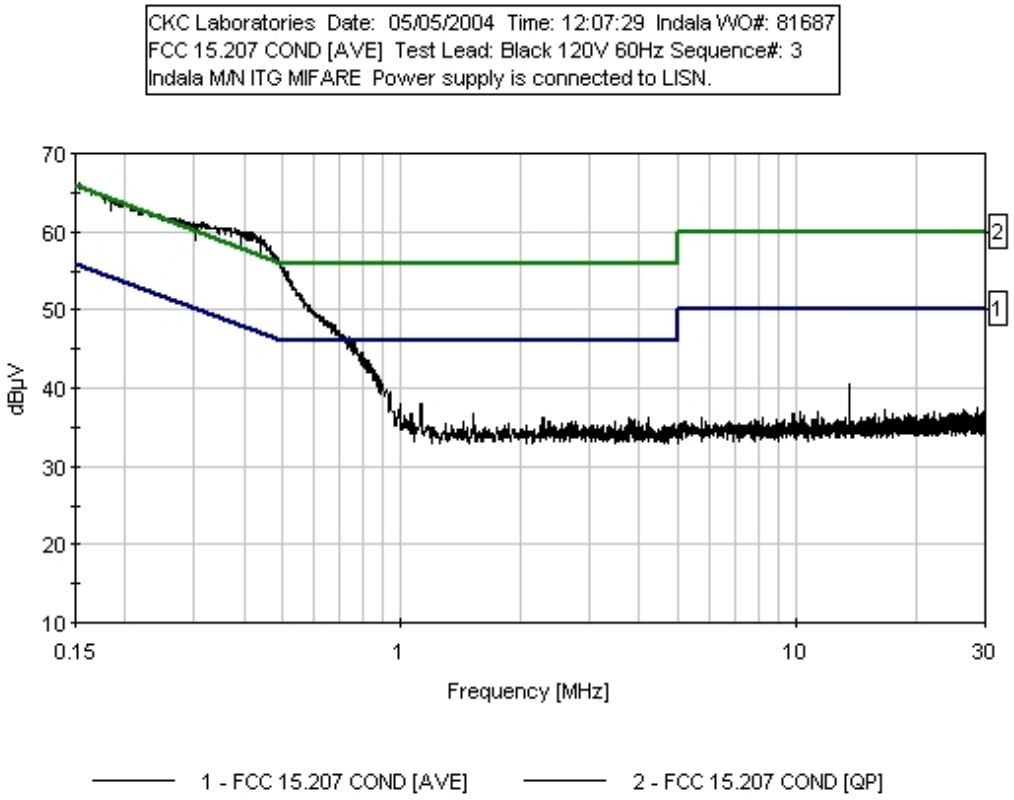
EUT is a Smart Card Reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. Power supply is placed on the ground plane. Excess length of the cable is bundled in the center. EUT drain wire connected to power supply ground terminal. EUT foil shield connected to DC negative on power supply. Note 1) Power supply ground terminal connected to ground plane with a short wire. Note 2) Power supply negative tied to ground terminal. Frequency Range Investigated: 0.15 to 30 MHz.

Transducer Legend:

T1=Site D Conducted cable with	T2=AN 00612 Insrt Loss-Black-L2

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	380.000k QP	53.5	+0.2	+0.6			+0.0	54.3	58.3	-4.0	Black
^	379.520k	59.2	+0.2	+0.6			+0.0	60.0	48.3	+11.7	Black
3	13.580M	39.1	+0.8	+0.5			+0.0	40.4	50.0	-9.6	Black
4	29.829M	36.5	+1.2	+0.6			+0.0	38.3	50.0	-11.7	Black
5	16.779M	35.9	+0.9	+0.4			+0.0	37.2	50.0	-12.8	Black
6	886.000k Ave	24.5	+0.2	+0.5			+0.0	25.2	46.0	-20.8	Black
^	885.506k	40.2	+0.2	+0.5			+0.0	40.9	46.0	-5.1	Black
8	150.000k Ave	32.5	+0.2	+1.8			+0.0	34.5	56.0	-21.5	Black
^	150.727k	64.1	+0.2	+1.8			+0.0	66.1	56.0	+10.1	Black
10	380.000k Ave	22.5	+0.2	+0.6			+0.0	23.3	48.3	-25.0	Black


CKC Laboratories Date: 05/05/2004 Time: 12:07:29 Indala WO#: 81687
FCC 15.207 COND [AVE] Test Lead: Black 120V 60Hz Sequence#: 3
Indala M/N ITG MIFARE Power supply is connected to LISN.
70
60
50
40
30
20
10
dBµV
0.15
1
10
30
Frequency [MHz]
2
1
1 - FCC 15.207 COND [AVE]
2 - FCC 15.207 COND [QP]

Test Location: CKC Laboratories •480 Los Viboras Rd. Site D • Hollister, CA 95023 • 1-831-637-8176

Customer: **HID**
Specification: **FCC 15.207 COND [AVE]**
Work Order #: **81687** Date: 05/05/2004
Test Type: **Conducted Emissions** Time: 13:25:07
Equipment: **Smart Card Reader** Sequence#: 4
Manufacturer: HID Tested By: Art Rice
Model: ITG MIFARE 120V 60Hz
S/N: CKC050504

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Smart Card Reader*	HID	ITG MIFARE	CKC050504

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Tektronix	CPS250	CPS-250TW18988

Test Conditions / Notes:

EUT is a Smart Card Reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. Power supply is placed on the ground plane. Excess length of the cable is bundled in the center. EUT drain wire connected to power supply ground terminal. EUT foil shield connected to DC negative on power supply. Note 1) Power supply ground terminal connected to ground plane with a short wire. Note 2) Power supply negative tied to ground terminal. Frequency Range Investigated: 0.15 to 30 MHz.

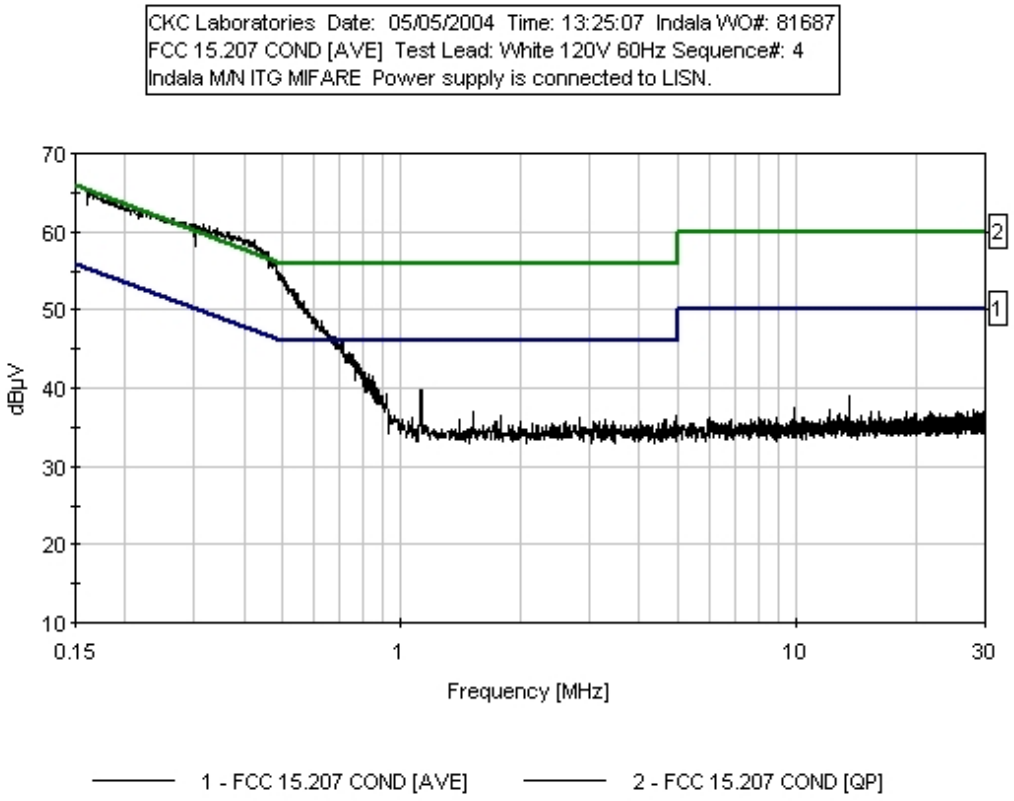
Transducer Legend:

T1=Site D Conducted cable with	T2=AN 00612 Insrt Loss-White-L1

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	380.000k QP	52.6	+0.2	+0.6			+0.0	53.4	58.3	-4.9	White
^	380.000k	58.5	+0.2	+0.6			+0.0	59.3	48.3	+11.0	White
3	151.000k QP	58.3	+0.2	+1.8			+0.0	60.3	65.9	-5.6	White
^	150.727k	63.9	+0.2	+1.8			+0.0	65.9	56.0	+9.9	White
5	1.119M Ambient	39.0	+0.3	+0.5			+0.0	39.8	46.0	-6.2	White
6	915.277k	38.6	+0.2	+0.5			+0.0	39.3	46.0	-6.7	White
7	13.580M	37.7	+0.8	+0.5			+0.0	39.0	50.0	-11.0	White
8	28.020M	35.2	+1.3	+0.7			+0.0	37.2	50.0	-12.8	White

9	15.427M	35.7	+0.9	+0.5	+0.0	37.1	50.0	-12.9	White
10	151.000k Ave	32.2	+0.2	+1.8	+0.0	34.2	55.9	-21.7	White
11	380.000k Ave	21.9	+0.2	+0.6	+0.0	22.7	48.3	-25.6	White



Test Location: CKC Laboratories •480 Los Viboras Rd. Site D • Hollister, CA 95023 • 1-831-637-8176

Customer: **HID**
Specification: **FCC 15.225/15.209 10m**
Work Order #: **81687** Date: 05/06/2004
Test Type: **Radiated Scan** Time: 09:34:28
Equipment: **Smart Card Reader** Sequence#: 9
Manufacturer: HID Tested By: Art Rice
Model: ITG MIFARE
S/N: CKC050504

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Smart Card Reader*	HID	ITG MIFARE	CKC050504

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Tektronix	CPS250	CPS-250TW18988

Test Conditions / Notes:

EUT is a Smart Card Reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. Power supply is placed on the ground plane. Excess length of the cable is bundled in the center. EUT drain wire connected to ground terminal on power supply. EUT foil shield connected to DC negative terminal on power supply. Note 1) Power supply ground terminal connected to ground plane with a short wire. Measuring the spurious signals. Frequency Range Investigated: 0.009 to 30 MHz. Test distance correction factor used in accordance with 15.31 of 40 dB per decade for comparison to the limit.

Transducer Legend:

T1=10m or 3m radiated cable Site D	T2=Mag Loop A/N 00432, S/N 2078
T3=CORR. FACT. @10M<30MHZ	T4=CORR. FACT. @30M<.490MHz

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	221.800k	47.7	+0.3	+8.9	-19.1	-40.0	+0.0	-2.2	20.7 Ambient level reading.	-22.9	Vert
2	5.800M	14.8	+0.8	+9.8	-19.1	+0.0	+0.0	6.3	29.5 Ambient level reading.	-23.2	Vert
3	224.100k	47.2	+0.3	+8.9	-19.1	-40.0	+0.0	-2.7	20.6 Ambient level reading.	-23.3	Horiz
4	27.124M	17.1	+1.7	+6.5	-19.1	+0.0	+0.0	6.2	29.5	-23.3	Vert
5	27.124M	16.7	+1.7	+6.5	-19.1	+0.0	+0.0	5.8	29.5	-23.7	Horiz
6	5.790M	14.2	+0.8	+9.8	-19.1	+0.0	+0.0	5.7	29.5 Ambient level reading.	-23.8	Horiz

7	10.640k	46.5	+0.0	+19.0	-19.1	-40.0	+0.0	6.4	47.0 Ambient level reading.	-40.6	Horiz
8	85.350k	36.9	+0.0	+10.3	-19.1	-40.0	+0.0	-11.9	29.0 Ambient level reading.	-40.9	Horiz
9	84.600k	36.3	+0.0	+10.3	-19.1	-40.0	+0.0	-12.5	29.0 Ambient level reading.	-41.5	Vert
10	10.270k	45.3	+0.0	+19.2	-19.1	-40.0	+0.0	5.4	47.4 Ambient level reading.	-42.0	Vert

Test Location: CKC Laboratories •480 Los Viboras Rd. • Hollister, CA 95023 • 1-831-637-8176

Customer: **HID**
Specification: **FCC 15.209**
Work Order #: **81687** Date: 05/05/2004
Test Type: **Radiated Scan/Maximized** Time: 10:42:06
Equipment: **Smart Card Reader** Sequence#: 1
Manufacturer: HID Tested By: Art Rice
Model: ITG MIFARE
S/N: CKC050504

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Smart Card Reader*	HID	ITG MIFARE	CKC050504

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Tektronix	CPS250	CPS-250TW18988

Test Conditions / Notes:

EUT is a Smart Card Reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. Power supply is placed on the ground plane. Excess length of the cable is bundled in the center. EUT drain wire connected to power supply ground terminal. EUT foil shield connected to DC negative on power supply. Frequency Range Investigated: 30 to 1000 MHz. Test distance correction factor of 20 dB per decade used in accordance with FCC 15.31 to extrapolate test data for comparison to the limit.

Transducer Legend:

T1=Chase bilog a/n 01996, s/n 2452 T2=10m or 3m radiated cable Site D
T3=Preamp-8447D Site D

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	447.559M	34.8	+15.7	+8.1	-27.7		+10.0	40.9	46.0	-5.1	Horiz
2	420.430M	34.3	+15.1	+7.7	-27.5		+10.0	39.6	46.0	-6.4	Vert
3	393.335M	34.4	+14.5	+7.4	-27.2		+10.0	39.1	46.0	-6.9	Vert
4	434.009M	32.9	+15.4	+7.7	-27.6		+10.0	38.4	46.0	-7.6	Vert
5	447.539M	31.9	+15.7	+8.1	-27.7		+10.0	38.0	46.0	-8.0	Vert
6	406.868M	32.8	+14.8	+7.6	-27.3		+10.0	37.9	46.0	-8.1	Vert
7	488.246M QP	30.5	+16.7	+8.4	-27.8		+10.0	37.8	46.0	-8.2	Horiz
^	488.236M	33.7	+16.7	+8.4	-27.8		+10.0	41.0	46.0	-5.0	Horiz
9	433.995M	31.8	+15.4	+7.7	-27.6		+10.0	37.3	46.0	-8.7	Horiz

10	135.636M QP	35.8	+11.8	+3.6	-27.3	+10.0	33.9	43.5	-9.6	Vert
^	135.643M	37.6	+11.8	+3.6	-27.3	+10.0	35.7	43.5	-7.8	Vert
12	542.484M QP	27.2	+18.0	+9.1	-28.2	+10.0	36.1	46.0	-9.9	Vert
^	542.476M	32.5	+18.0	+9.1	-28.2	+10.0	41.4	46.0	-4.6	Vert
14	244.122M	36.0	+10.3	+5.4	-26.8	+10.0	34.9	46.0	-11.1	Vert
15	488.239M QP	27.6	+16.7	+8.4	-27.8	+10.0	34.9	46.0	-11.1	Vert
^	488.231M	30.6	+16.7	+8.4	-27.8	+10.0	37.9	46.0	-8.1	Vert
17	162.739M	33.6	+11.8	+4.0	-27.1	+10.0	32.3	43.5	-11.2	Vert
18	40.755M	30.1	+13.2	+2.1	-27.6	+10.0	27.8	40.0	-12.2	Horiz
19	81.398M	34.3	+7.8	+3.0	-27.5	+10.0	27.6	40.0	-12.4	Vert
20	230.572M	33.4	+10.2	+5.1	-26.8	+10.0	31.9	46.0	-14.1	Vert
21	217.010M	33.4	+10.0	+5.0	-26.8	+10.0	31.6	46.0	-14.4	Vert
22	257.682M	31.8	+10.4	+5.7	-26.7	+10.0	31.2	46.0	-14.8	Vert
23	230.570M	32.3	+10.2	+5.1	-26.8	+10.0	30.8	46.0	-15.2	Vert